

MULCHING

(Acre)
Code 484

Natural Resources Conservation Service
Conservation Practice Standard

I. Definition

Applying plant residues, byproducts, or other suitable materials not produced on the site to the soil surface.

II. Purpose

This practice may be used to:

- conserve moisture
- prevent surface compaction or crusting
- reduce runoff and erosion
- control weeds
- moderate/modify soil temperature
- aid in establishing plant cover

III. Conditions Where Practice Applies

This practice may be applied on soils subject to erosion on which low-residue producing crops such as grapes and small fruits are grown, on critical areas, on soils that have a low infiltration rate, and where needed for control of weeds such as around newly planted trees and shrubs.

IV. Federal, State, and Local Laws

Users of this standard shall comply with applicable federal, state and local laws, rules, regulations or permit requirements governing **mulching**. This standard does not contain the text of federal, state, or local laws.

V. Criteria

A. General Criteria Applicable to All Purposes

The type of mulching material selected should be based on cost, time of year, soils, percent slope, anticipated runoff velocities, and landscape position.

If the area to be mulched is to be seeded, see NRCS Field Office Technical Guide (FOTG) Section IV, Standard 342, Critical Area Planting, for seedbed preparation, lime, fertilizer, and seeding requirements.

Mulch shall consist of either natural and/or artificial materials such as plant residue (including cereal grain straw, grass hay, wood chips, bark and wood fiber), byproducts, gravel, plastic, fabric, or other equivalent materials of sufficient dimension (depth or thickness) and durability to achieve the intended effect for the required time period.

1. Criteria for Site Preparation

Soil surface shall be prepared prior to the application of the mulch material in order to achieve desired purpose and to ensure optimum contact between soil and mulch. All areas to be mulched shall be reasonably smooth and free of rills, gullies, and debris. Concentrated flow sources above the site where mulch is applied shall be diverted or mulch designed to withstand anticipated runoff velocities.

2. Criteria for Materials

Mulch material shall be free of diseased plant residue, weed seeds, and harmful chemical residues. Manufactured mulches should be applied according to the manufacturer's specifications. General methods for applying manufactured mulches are described in V.B. Mulch Anchoring Methods.

3. Criteria for Application

Mulch may be applied to both seeded and unseeded areas.

Mulch shall be applied immediately after seeding.

When temporary erosion control is needed, mulch may be applied anytime soil and site conditions are suitable for spreading and anchoring.

4. Mulch Application Rate

Straw and hay mulch shall be applied at the rate of 1½ to 2 tons per acre. This application results in a layer of 6 to 7 stems, 1 to 2 inches thick. Some soil can be seen after the application.

Wood chips or wood bark shall be applied at the rate of 6-9 tons per acre to achieve a minimum of 80 percent ground cover.

Wood cellulose fiber mulch, applied with a hydroseeder, shall be applied at the rate of 1,500 to 2,000 pounds per acre. Apply a tackifier when the slope exceeds 3 to 1.

Long-fibered wood cellulose shall be applied at the rate of ¾ to 1¼ tons per acre.

Corncobs shall be applied at the rate of 5 tons per acre.

Gravel shall be applied approximately 2 inches deep and shall consist of pieces ¾ to 2 inches in diameter and shall achieve a minimum of 90 percent ground cover.

5. Fiber Blankets and Mats

Erosion control products manufactured from wood fiber, straw, or paper are intended for use in high water velocity conditions. Design and install according to the manufacturer's instructions.

B. Mulch Anchoring Methods

1. Mulch Anchoring Tool or Disk (Serrated Blades)

Apply mulch and pull a mulch anchoring tool over mulch. Use equipment with serrated straight disks spaced 6 to 10 inches or other suitable equipment approved by the Natural Resources Conservation Service. Operate as close to the contour as possible. Mulch material should be tucked into the soil surface 2 to 3 inches. Use on areas where concentrated flow velocity is less than 4 feet per second.

2. Wood Cellulose Fiber

Apply with a hydromulcher immediately after spreading mulch. Reduce mulch applications to 3,000 pounds per acre and apply 750 pounds of wood fiber per acre

with a nontoxic, biodegradable tackifier. Use on areas without concentrated flow.

3. Tackifier or Binder

Apply asphalt emulsion or similar product with suitable equipment by spraying asphalt into the mulch as it is applied. Emulsified asphalt shall conform to the requirements of ASTM Specification D977. Rate of application is 0.5 gallon per square yard (242 gallons per acre) or according to manufacturer's recommendations. Material shall be nontoxic to plant life. Use on areas without concentrated flow.

Follow the manufacturer's recommendations on mixing and temperature control. The mulch materials and tackifier shall be blown from a machine and uniformly deposited over the area in one operation.

The machine used for placement of mulch shall blow or eject by constant air stream a controlled amount of straw or hay. It shall also introduce into the air stream a spray of asphalt or similar product.

Mulch materials shall not contain moisture in excess of that which will permit uniform feeding through the machine.

4. Polypropylene Plastic, Netting, or Jute

Apply plastic netting over a mulch application and staple according to manufacturer's recommendations using 11-gauge or heavier wire staples. Use on areas without concentrated flow or where concentrated flow velocity is less than 4 feet per second.

On slopes, mats and nets may be run either up and down or cross slope. In areas of concentrated flow, mats and nets shall be laid parallel to the direction of flow and spread evenly without stretching to allow maximum contact with the soil. Adjacent edges should be overlapped a minimum of 3 inches with the adjoining mats or nets. Staples of 11 gauge or heavier will be used to hold the mats and nets in place. Staples shall be U-shaped with a 1 inch crown. Staple length shall be determined based on soil condition.

- Highly compacted soils: 6 inches.

- Friable soils: 8 inches.
- Loose or sandy soils: 10 inches.

Lay downstream blankets first, working upstream. The netting side of the blanket shall be on the top side after installation. Mat and net edges and middles will be stapled according to manufacturer's recommendations.

5. Peg and Twine

After mulching, divide the area into blocks approximately one square yard in size. Drive 4 to 6 pegs per block to within 2 to 3 inches of the soil surface. Anchor mulch by stretching twine between pegs in a crisscross pattern on each block. Secure twine around each peg with two or more turns. Drive pegs flush with soil surface to allow mowing. Use on areas without concentrated flow.

6. Slit

Cut mulch into soil surface with square edge spade. Make cuts in contour rows spaced 18 inches apart. Use on small areas without concentrated flow.

7. Soil

Small areas of mulch can be covered with soil. The soil shall be free of stones and debris, and distributed over the mulch in a thin uniform layer. Use on small areas without concentrated flow.

8. Soil and Stones

Bury edge of plastic in a trench 6 inches deep. Firm soil over plastic in the trench. Use stones to hold plastic down in other places as needed. Use on small areas without concentrated flow.

C. Additional Criteria Applicable to Conserve Soil Moisture

Mulch material shall be applied after seeding and shall cover at least 60 percent of the soil surface to reduce potential evaporation.

D. Additional Criteria Applicable to Moderate/Modify Soil Temperature

Nonporous, opaque and dark-colored material shall be used to raise soil and ambient air temperature below the mulch. Light-colored material will be used to cool soil and ambient soil temperature below the mulch. The mulch shall be applied to the desired soil and air temperature below the mulch can be achieved.

The material should be sufficient thickness to persist for the period of time required for the temperature modification.

The percent coverage shall be 100 percent over the area treated.

E. Additional Criteria Applicable to Control Weed Growth

Mulches applied around growing plants or prior to seedling development shall provide 100 percent ground cover. Thickness of the mulch shall be adequate to prevent emergence of targeted weeds. Use colored or infrared transmissible (IRT) plastic when plastic mulch is used.

VI. Considerations

Disturbed areas that will not have additional construction activity for 60 days or completed sites that will not be permanently seeded for periods of 60 days or longer should be mulched.

Consider impacts that mulch material may have on other organisms.

Installation of this practice with any others proposed should not negatively impact any federal or state listed rare, threatened, or endangered species or their habitat.

Organic mulches are the most effective mulch materials. Hydro fiber mulches are effective when used in combination with grass hay and cereal grain straw. Chemical soil binders are less effective than organic mulches.

Straw or corncobs may attract mice and increase the possibility of plant damage.

Consider the carbon to nitrogen (C:N) ratio when selecting mulch materials in relation to nitrogen immobilization and decomposition.

Materials suitable for use as mulch material include wood bark, chips, wood shavings, and sawdust, fiber matting with plastic netting, animal manure, and materials from food processing plants. Mulching can provide an environmentally acceptable and economically sound method utilizing these bio-products while also deriving conservation benefits.

Mulch may increase pathogens that live in association with the mulch material.

VII. Plans and Specifications

Specifications and the purpose for applying this practice shall be prepared for each site and recorded using approved specification sheets, job sheets, technical notes, and narrative statements in the conservation plan, construction specifications, or other acceptable documentation. Documentation shall include:

- type of mulch material used
- percent cover and/or weight of mulch material
- timing of application
- site preparation requirements
- listing of netting, tackifiers, or method of anchoring
- operation and maintenance

VIII. Operation and Maintenance

Mulched areas will be periodically inspected, reinstalled or repaired as needed.

Operation of equipment near the site shall not damage the intended purpose of the mulch.

Inadvertent movement of mulching or any mulching operation materials (including degraded or decomposed materials) by wind, surface or subsurface water, or mechanical means must not pose a direct or indirect cumulative environmental or safety hazard.

Prevent any fire damage to the mulch material.

IX. References

USDA, NRCS Wisconsin Field Office Technical Guide (FOTG), Section I, Erosion Prediction, Revised Universal Soil Loss Equation (RUSLE).